

**Work Order ID 62609**

Page 1

October 5, 2010 10:40:27 AM

Item ID: D212-664-201TRN

Accept



Setup Start



Revision ID:

Item Name: Crosstube Turning Detail

Stop



Start Date: 10/05/10 Start Qty: 1.00



Cust Item ID:

Required Date: 10/15/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D212-664-241	Rev D

100	MORI SEIKI CNC LATHE LARGE	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
-----	----------------------------	------	--------------------	----------	----------	--------------

Mori Seiki	Memo	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
------------	------	------	--------------------	----------	----------	--------------

Mori Seiki CNC Lathe Large	1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
----------------------------	--	--------------------	----------	----------	--------------

2-Turn first side as per Folio FA114

3- File transition lines smooth.

110	QC1- Inspect dimensions to dimension sheet	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
-----	--	------	--------------------	----------	----------	--------------

QC	Memo	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
----	------	------	--------------------	----------	----------	--------------

Quality Control	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
-----------------	--------------------	----------	----------	--------------

120	MORI SEIKI CNC LATHE LARGE	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
-----	----------------------------	------	--------------------	----------	----------	--------------

Mori Seiki	Memo	0.00	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
------------	------	------	--------------------	----------	----------	--------------

Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA114	<i>OK 10/10/06</i>	<i>1</i>	<i>0</i>	<i>_____</i>
----------------------------	---------------------------------------	--------------------	----------	----------	--------------

2- File transition lines smooth.

3-Remove sand and plugs

4- scribe batch # and part # as per dwg

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**Work Order ID 62609**

Page 2

October 5, 2010 10:40:27 AM

Item ID: D212-664-201TRN

Accept



Setup Start



Revision ID:

Item Name: Crosstube Turning Detail

Stop



Start Date: 10/05/10 Start Qty: 1.00



Cust Item ID:

Required Date: 10/15/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00

OK 10/10/07

1 0



QC

Memo

0.00

Quality Control

140

QC8- Inspect parts - second check

0.00

OK 10/10/07



QC

Memo

0.00

Quality Control

150

Crosstubes Chemical Conversion

0.00

HandFXtube

Hand Finishing Crosstubes

Memo

0.00

SAD  
10-10-13

OK

OK

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**Work Order ID 62609**

Page 3

October 5, 2010 10:40:28 AM

Item ID: D212-664-201TRN

Accept



Setup Start



Revision ID:

Item Name: Crosstube Turning Detail

Stop



Start Date: 10/05/10 Start Qty: 1.00



Cust Item ID:

Required Date: 10/15/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_

Date: \_\_\_\_\_

Tooling: \_\_\_\_\_

Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_

Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_

Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160



QC

QC3- Inspect Part Finish

0.00

10-10-13

Quality Control

170



Packaging

Packaging

0.00

10-10-13 0

Packaging

Memo

0.00

Identify and stock in kanban rack  
Location: Carding Gear

180



QC

QC21- Final Inspection - Work Order Release

0.00

Quality Control

Memo

0.00

10/10/13 JH

ME  
10-10-13

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

Page 1

October 5, 2010 10:40:26 AM

Work Order ID: 62609



Parent Item: D212-664-201TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 10/05/10

Required Date: 10/15/10

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6006-129		Manufactured	No			120	Each	37.0000	1	1			

Crosstube Material

Location	Loc Qty	Loc Code
LG	37	
23970	2	
26550	14	
34690	11	
38338	10	

10/05/10/10/06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD

Work Order:

62609

Description: Crosstube Assembly (205/212 High Aft)

Part Number:

D212-664-241

Inspection Dwg: D212-664-241 Rev: D

Page 1 of 1

## FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	208	—	Vern	ML-7
	R0.063	+/-0.010	R.063	—	Rad-gage	REF
	2.990	+0.005/-0.000	2.993	—	Micr	ML-03
	5.237	+/-0.030	5.237	—	Vern	ML-7
	2.600	+0.005/-0.000	2.601	—	Vern	ML-7
	2.686	+0.005/-0.000	2.690	—	Micr	ML-03
	2.770	+0.005/-0.000	2.774	—	Micr	ML-03
	2.854	+0.005/-0.000	2.858	—	Micr	ML-03
	2.938	+0.005/-0.000	2.941	—	Micr	ML-03
	3.021	+0.005/-0.000	3.026	—	Micr	CNC-03
	3.133	+0.005/-0.000	3.138	—	“	“
	3.179	+0.005/-0.000	3.183	—	“	“
SIDE B	0.200	+/-0.010	205	—	Vern	ML-7
	R0.063	+/-0.010	R.063	—	Rad-gage	REF
	2.990	+0.005/-0.000	2.992	—	Micr	ML-03
	5.237	+/-0.030	5.237	—	Vern	ML-7
	2.600	+0.005/-0.000	2.603	—	Vern	ML-7
	2.686	+0.005/-0.000	2.690	—	Micr	ML-03
	2.770	+0.005/-0.000	2.775	—	Micr	ML-03
	2.854	+0.005/-0.000	2.858	—	Micr	ML-03
	2.938	+0.005/-0.000	2.942	—	Micr	ML-03
	3.021	+0.005/-0.000	3.026	—	Micr	CNC-03
	3.133	+0.005/-0.000	3.138	—	Micr	CNC-03
	3.179	+0.005/-0.000	3.184	—	Micr	CNC-03
	124.362	+/-0.020	124.360	—	Micr	ML-03

Measured by: *Am*Audited by: *S*

Preliminary Approval: N/A

Date: 10/10/07

Date: 10/10/07

Date: N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM	<i>M</i>
D	10.08.03	Dimension 124.362 was 124.36	KJ <i>skj</i>	<i>M</i>

D

Item	Qty	Qty	Part Number	Description
	-241	-241B		
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

## GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6006-129  
FINISHED LENGTH = 124.362±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF  
USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)  
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING  
IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE  
OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS  
AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1  
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE  
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE  
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR  
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND  
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT  
HAS NOT BOTTOMED-OUT AFTER TORQUING.

W1062609

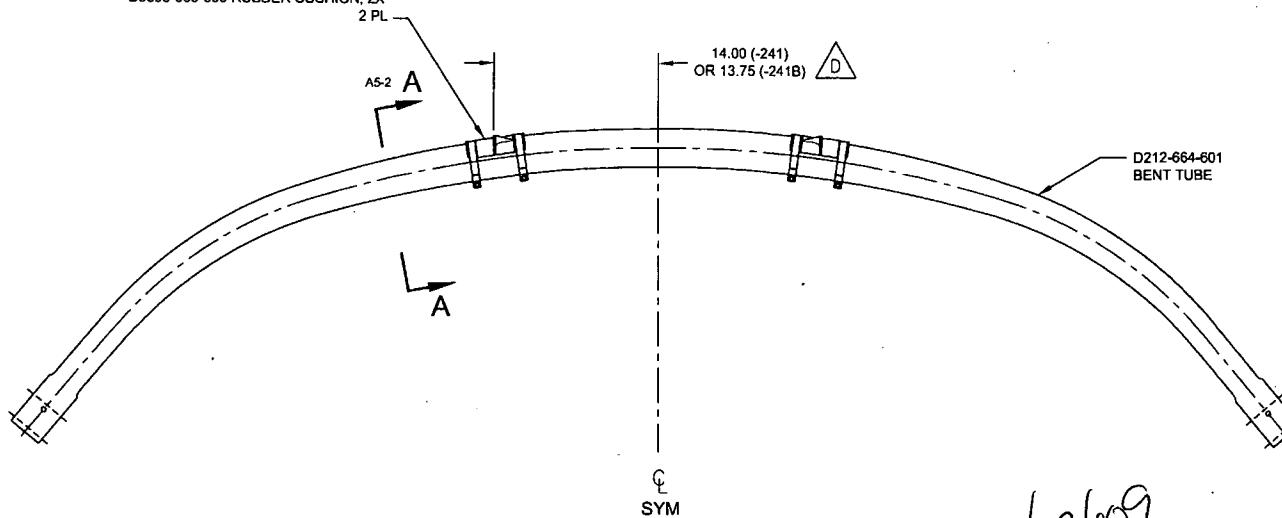
RELEASED  
2009-10-29  
M

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO. D212-664-241	
CHECKED	PP	REV. D SHEET 1 OF 4	
MFG. APPR.	DS	TITLE CROSSTUBE ASS'Y (205/212 HI AFT) NTS	
APPROVED	PP	SCALE	
DE APPR.	PP	COPRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	09.09.30		

8 1 7 6 5 4 3 2 1

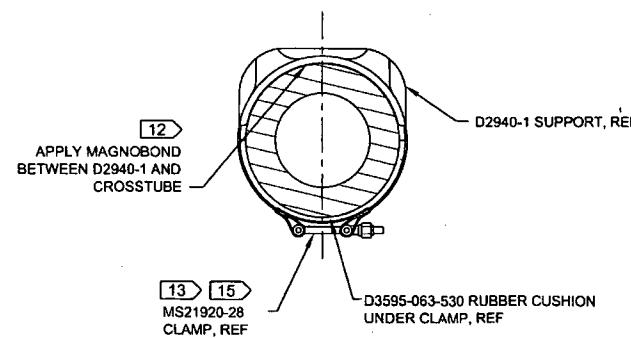
12 13 15  
D2940-1 SUPPORT  
MS21920-28 CLAMP, 2X  
D3595-063-530 RUBBER CUSHION, 2X

2 PL



D212-664-241/241B  
ASSEMBLY DETAIL

D



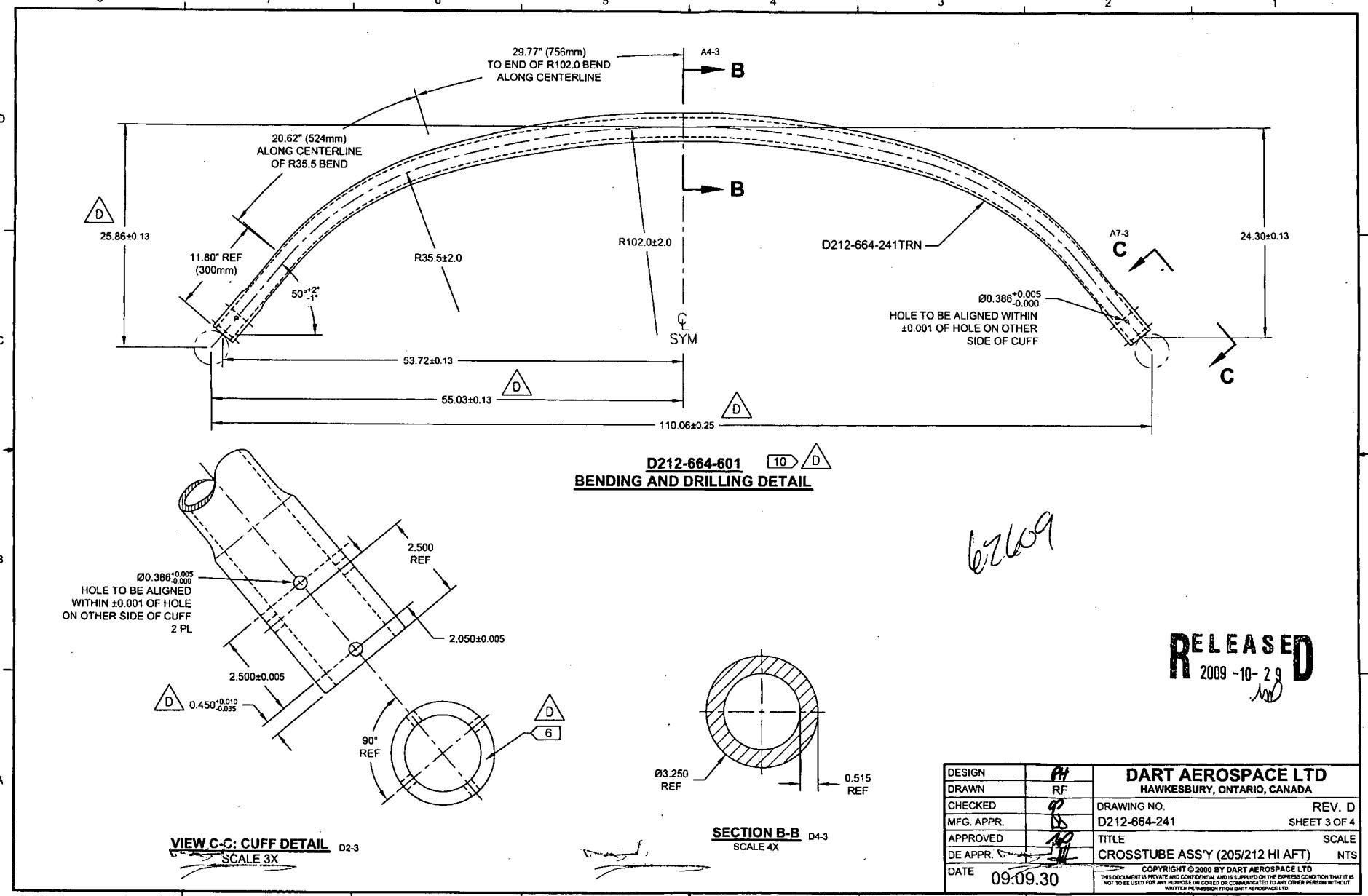
SECTION A-A D6-2  
SCALE 4X

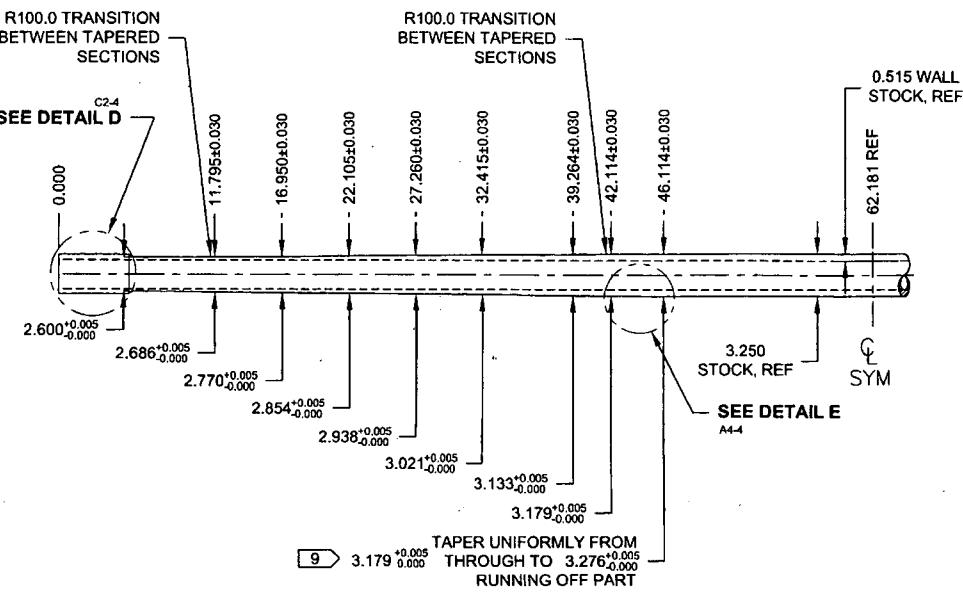
8 7 6 5 4 3 2 1

DESIGN	PH	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	Q	DRAWING NO.
MFG. APPR.	BS	D212-664-241
APPROVED	AD	REV. D
DE APPR.	W	SHEET 2 OF 4
DATE	09.09.30	TITLE
		CROSSTUBE ASSY (241/241B HI AFT) NTS

COPYRIGHT © 2000 BY DART AEROSPACE LTD.  
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS  
NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT  
WRITTEN PERMISSION FROM DART AEROSPACE LTD.

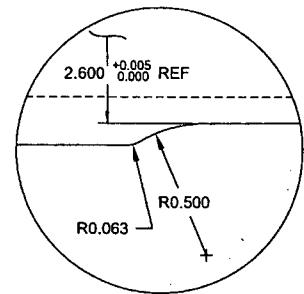
RELEASED  
2009-10-28  
W



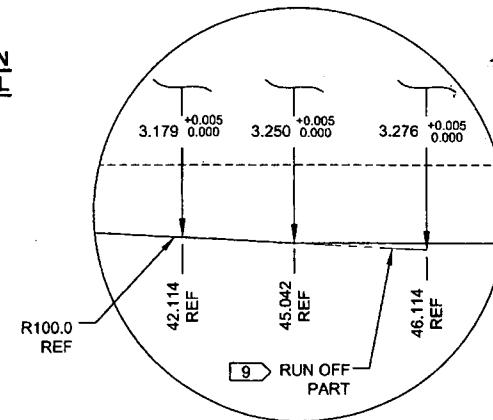


9 3.179<sup>+0.005</sup><sub>0.000</sub> TAPER UNIFORMLY FROM  
THROUGH TO 3.276<sup>+0.005</sup><sub>-0.000</sub>  
RUNNING OFF PART

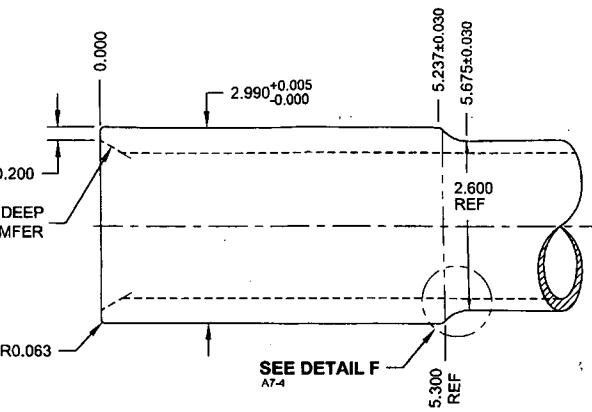
**D212-664-241TRN**  
**TURNING DETAIL**



**DETAIL F:**  
**CUFF TRANSITION** C2-4  
SCALE 10X



**DETAIL 1**  
**TAPER RUN**  
NOT TO SCALE



**DETAIL D:**  
**CROSSTUBE CUFF** D8-  
SCALE 5X

6260

RELEASED  
2009-10-29  
MAP

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	99	DRAWING NO.	REV. D
MFG. APPR.	DS	2D12-664-241	SHEET 4 OF 4
APPROVED	AD	TITLE	SCALE
DE APPR.	MM	CROSSTUBE ASSY (PAC-11 HI AT) NTS	
DATE	09.09.30	COPYRIGHT © 2000 DART AEROSPACE LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS PROVIDED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR DISCLOSED TO ANY OTHER PERSON WITHOUT THE WRITTEN CONSENT OF DART AEROSPACE LTD.	